सत्यमेव जयते

DIGITAL AGRICULTURE MISSION

OPERATIONAL GUIDELINES (2024)

Department of Agriculture and Farmers Welfare
Ministry of Agriculture and Farmers Welfare
Government of India

Table of Contents

List of Abbreviations

S. No.	Abbreviation	Full Form
1	AI	Artificial Intelligence
2	API	Application Programming Interface
3	APK	Android Application Package
4	CCE	Crop Cutting Experiments
5	CDAC	Centre for Development of Advanced Computing
6	CRM	Customer Relationship Management
7	CSCs	Common Service Centers
8	DBT	Direct Benefit Transfer
9	DCS	Digital Crop Survey
10	DGCES	Digital General Crop Estimation Survey
11	DGQI	Data Governance Quality Index
12	DLT	District Level Team
13	DoLR	Department of Land Resources
14	DPI	Digital Public Infrastructure
15	DPR	Detailed Project Report
16	FASAL	Forecasting Agricultural output using Space, Agro-meteorology and Land based observations
17	GIS	Geographical Information Systems
18	GRVM	Geo-referenced Village Maps
19	ICAR	Indian Council of Agricultural Research
20	IAS	Improvement of Agriculture Statistics
21	IEC	Information Education and Communication
22	IFD	Integrated Finance Division
23	IMD	Indian Meteorological Department
24	IoTs	Internet of Things
25	ISRO	Indian Space Research Organization
26	KCC	Kisan Credit Card
27	Krishi - DSS	Krishi – Decision Support System
28	KY	Krishonnati Yojana
29	LGD	Local Government Directory
30	MIS	Management Information System
31	ML	Machine Learning
32	MNCFC	Mahalanobis National Crop Forecasting Centre
33	MoA&FW	Ministry of Agriculture and Farmers Welfare
34	MoU	Memorandum of Understanding
35	MSP	Minimum Support Price
36	NBSS&LUP	National Bureau Of Soil Survey And Land Use Planning
37	NeGP-A	National e-Governance Plan in Agriculture
38	NIC	National Informatics Centre
39	NRSC	National Remote Sensing Centre
40	NSMP	National Soil Mapping Programme
41	NSSO	National Sample Survey Office
42	NWIC	National Water Informatics Centre
43	PIC	Project Implementation Committee
44	PoC	Proof of Concept

S. No.	Abbreviation	Full Form
45	PM KISAN	Pradhan Mantri Kisan Samman Nidhi
46	PMFBY	Pradhan Mantri Fasal Bima Yojana
47	PMU	Project Monitoring Units
48	PPOC	Primary Points of Contact
49	PSC	Project Steering Committee
50	RoR	Record of Rights (Land Records)
51	SAC	Space Application Center
52	SASA	State Agricultural Statistical Authority
53	SASDB	State Aadhaar-seeded Database
54	SDAEO	Subdivisional Agriculture Extension Officer
55	SFDB	State Farmer Database
56	SLUSIs	Soil and Land Use Survey of India
57	SME	Subject Matter Expert
58	SPMU	State Project Management Unit
59	UAV	Unmanned Aerial Vehicle
60	UAT	User Acceptance Testing
61	UFSI	Unified Farmer Service Interface
62	ULPIN	Unique Land Parcel Identification Numbers
63	USDA	United States Department of Agriculture
64	WINDS	Weather Information Network and Data Systems

1. Background

1.1. The agriculture sector plays a vital role in development of the Indian economy. To augment the sector's contribution to the nation's growth, India's central and state governments are implementing several schemes to benefit the nation's farmers. Taking into cognizance the role of technology in providing better services to the citizens of the country, the Ministry of Agriculture and Farmers Welfare (MoA&FW), Govt of India, is witnessing a paradigm policy shift from the traditional approach to farming and monitoring scheme implementation to embracing AgriTech.

1.2. In recent years, India's digital revolution has transformed governance and service delivery by creating digital identities and secured payments and transactions. This has spurred a thriving digital ecosystem in finance, healthcare, education, and retail, positioning India as a leader in citizen-centric digital solutions. Some examples include Aadhar, which is a Unique Identification Number that is linked to the individual's biometric readings; Digi Locker for storing an individual's data securely; eSign, which lets individuals electronically sign contracts and eliminates the need for physical documents; eKYC facility for instant verification of an individual; Aadhar-enabled Payment Bridge and Unified Payments service (UPI) for trustful digital payments; Electronic Health Records (EHR); Digital Infrastructure for Knowledge Sharing (DIKSHA), etc.

1.3. To create a similar digital ecosystem in the agriculture sector, the government announced building digital public infrastructure for agriculture in the Union Budget 2023-24. Further, in the Union Budget 2024-25, the augmentation of the Digital Public Infrastructure (**DPI**) initiative for the agricultural sector was announced. This Digital Public Infrastructure aims to provide comprehensive and useful data on farmers comprising authenticated demographic details, land holdings and crops sown. It will include cultivators & tenant farmers, as per the policy of the State Government. It would also connect to relevant Digital Public Infrastructure of the State Governments and Ministries of the Government of India to use data of farmers on livestock, fisheries, soil

health, other vocations, family details and schemes and benefits availed, leading to innovative farmer-centric digital services in the agriculture sector.

1.4. In line with the Viksit Bharat@2047 vision, the cabinet has approved the Digital Agriculture Mission (hereinafter called "**Mission**"). This initiative aims to create a robust digital agriculture ecosystem in the country, fostering innovative, farmer-centric digital solutions and providing timely and reliable crop-related and farmer-related information. The adoption of digital technologies in agriculture will help improve scheme governance by providing easier access to services, bringing greater transparency, enabling data-driven decision-making, and facilitating evidence-based monitoring.

2. Digital Agriculture Mission

2.1. About Digital Agriculture Mission

2.1.1. The Digital Agriculture Mission seeks to enable a robust digital agriculture ecosystem in the country to drive innovative farmer-centric digital and space-tech solutions. Accordingly, the Mission is conceived as an umbrella scheme to support digital agriculture initiatives, such as creating Digital Public Infrastructure, Digital General Crop Estimation Survey (DGCES) and other IT initiatives undertaken by Central Government/State Government/Academic & Research Institutions. The Cabinet has approved the Digital Agriculture Mission with a total outlay of ₹ 2,817 Crores with a Central Share of ₹ 1,940 Crores for 5 years (FY 2021-22 to FY2025-26).

Digital Agriculture Mission aims to establish a comprehensive farmer-centric digital and space-tech ecosystem to enhance transparency and efficiency in the execution of government programs while providing crucial support for evidence-based policymaking for farmers' welfare.

2.1.2. The Digital Agriculture Mission aligns with the Government's vision of transforming India into a digitally empowered society and knowledge economy. The success of Digital Public Infrastructures in other sectors, such as health, education, finance, etc., underscores the potential for similar transformative impacts in the agriculture sector.

2.2. Objectives of Digital Agriculture Mission

Key objectives of the Digital Agriculture Mission are highlighted as under:

a) To create a robust and holistic farmer-centric digital ecosystem in the country.
b) To improve transparency and efficiency in the implementation of government initiatives.
c) To support the government in making informed policy decisions.

d) To promote public and private innovation and partnerships, encouraging Agri techs in India's digital economy.

2.3. Benefits of the Mission

By leveraging trustful data on farmers, farmlands and crops and the use of modern digital technologies, such as data analytics, artificial intelligence, and remote sensing, the Mission aims to make service delivery mechanisms more efficient and transparent in the interest of farmers in the following areas:

2.3.1. A farmer would be able to digitally identify and authenticate himself/herself to access benefits and services, obviating cumbersome paperwork and with little or no need to physically visit various offices or service providers. Some examples include availing Government schemes and crop loans, connecting to agri-input suppliers and buyers of agricultural produce, accessing personalized advisories in real time, etc.

2.3.2. The trustful data would help government agencies make schemes and services more efficient and transparent, such as paperless MSP-based procurement, crop insurance, and credit card-linked crop loans. Further, the digitally captured crop-sown data and remote-sensing data will help in accurate crop area estimation, crop diversification, and evaluating irrigation needs according to crop and season.

2.3.3. The digital public goods developed under the Mission will also enable the stakeholders in the agriculture ecosystem to establish efficient value chains for agricultural inputs and post-harvest processes.

2.4. Key Components of Digital Agriculture Mission

(a) Digital Public Infrastructure (DPI) for Agriculture, i.e. Agristack, Krishi Decision Support System, Comprehensive Soil Fertility, and Profile Maps.
(b) Digital General Crop Estimation Survey (DGCES)

(c) Support to Mahalanobis National Crop Forecasting Centre (MNCFC)

(d) Activities undertaken in erstwhile NeGP- A scheme (subsumed in the Mission) which includes Development & maintenance of IT Infrastructure/Application of DA&FW and Support to States, Academic / Research Institutions for IT initiatives.

2.5. Component-wise project outlay

2.5.1. The Component wise approved project outlay for the next five years, FY 2021-22 to 2025-26, is as follows:

All Figures are in ₹ Crore

Component-wise Approved Project Outlay									
Sl No.	**Item**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**Total**	**Central Share**	**State Share**
(I)	Digital Crop Survey (DCS)	--	--	--	821.6	1200	2068	1240.79	827.192
(II)	Digital General Crop Estimation Survey (DGCES)	--	--	--	50	50	100	100	--
(III)	Comprehensive Soil Fertility and Profile Mapping	--	--	--	50	50	100	100	--
(IV)	Service Integration for AgriStack Use Cases	--	--	--	40	60	100	100	--
(V)	Support to MNCFC for Krishi DSS, Crop Health and Crop Assessment	--	--	0.75	30	30	60	60	--
(VI)	Support to States, Academic / Research Institutions for IT initiatives	17.59	9.62	70.64*	60	65	125	75	50
(VII)	Central Components	22.45	11.27	48.05	65.22	65	264.21	264.21	--
Total:		40.04**	20.89**	119.44**	1116.82	1520	2817.22	1940	877.192

** Including Digital Crop Survey Pilots taken up in 12 States*

***Central Share actual expenditure*

2.5.2. The Digital Crop Survey and Support to States for IT initiatives components would be operationalized as Centrally Sponsored components, whereas other components would be implemented as central sector components.

2.5.3. Under the scheme (Centrally Sponsored Component), the funding pattern between the Centre and the State will be 60:40 respectively: North-Eastern and Himalayan States: 90% Central share and 10% State share; and Union Territories (with and without legislature): 100% Central share.

2.5.4. 2.5% of the total project cost will be administrative expenses. These expenses will be used to source manpower and infrastructure to support the scheme's effective and efficient implementation at the State and central levels.

2.6. Components for releasing funds under the Digital Agriculture Mission

2.6.1. **Centrally Sponsored Project:**

(a) Support to States/UTs for projects involving the use of emerging/modern digital technologies such as Satellite Remote Sensing and Geographical Information Systems (GIS), Unmanned Aerial Vehicle (UAV) & Drone based services, Artificial Intelligence (AI), Internet of Things (IoTs), Machine Learning (ML), Robotics, Blockchain, etc.

(b) Support to the States for conducting the Digital Crop Survey.

(c) Support to the States in terms of providing the necessary resources, training, training materials, guidelines and systems needed for effective implementation of the digital agriculture projects and pilots of the Government of India.

2.6.2. **Central Sector Components (100% Central Funds):**

(a) Support to Mahalanobis National Crop Forecast Centre (MNCFC) of DA&FW for implementation FASAL 2.0 project and other projects involving use of modern

digital & emerging technologies including Geo-spatial technology so that it becomes the centre of excellence for deploying remote sensing and geospatial technologies in agriculture.

(b) Support for Ground level Data collection for Crop Health, Ground truthing, Crop Yield and other important survey which are required for accurate crop mapping, crop area & yield estimation to be conducted through DA&FW and MNCFC.

(c) Conducting the Digital General Crop Estimation Survey through the State Government for yield estimation.

(d) Support to the National Sample Survey Office (NSSO) for independent supervision of the Digital General Crop Estimation Survey

(e) Support to Soil & Land Use Survey of India (SLUSI) for Soil Fertility and Profile Mapping.

(f) Sending advisories to farmers through SMS/Mobile Applications/Other applications/new social media communication technologies.

(g) Deployment and maintenance of call centres/ centres to extend support to farmers regarding new technologies, the farmers database, and UFSI.

(h) Development of IT Infrastructure such as cloud Service, Krishi Monitoring Support Center, Krishi Decision Support System

(i) Maintenance of existing infrastructure (both hardware and software), including those covered under the erstwhile NeGPA.

(j) Development & Maintenance of various core registries, support registries, Unified Farmers Service Platform, Sandbox environment and Consent Manager (both hardware and software components) under Agristack.

(k) Support to ICAR and other academic & research institutes for development of scalable digital solutions in agriculture using advanced and emerging technologies and based on digital public infrastructure being developed under the Mission.

(l) Engaging Start-ups and other Private companies for innovative solutions.

(m) Conducting Special surveys with the use of Technology by government/private entities

(n) Development of reference applications for the Centre by states/any government/private entities for adoption and usage by the Centre

(o) Capacity Building of Centre & State officials in using new & emerging Technology.

(p) Providing project-based manpower support or setting up Project Monitoring Units (PMUs) in Centre & States to implement Digital Public Infrastructure and related initiatives.

(q) Development of various IT Applications and Apps for the Department.

(r) Artificial Intelligence (AI) initiatives for the agriculture.

3. AgriStack

One of the key components of the Digital Agriculture Mission is to build sector-focused Digital Public Infrastructures. The DPI architecture will engender innovation and development of various applications and solutions by public and private agencies, benefiting around 11 crore farmers in the country. AgriStack is one of the DPIs envisioned by the Ministry.

3.1. About AgriStack

Agri Stack is envisaged as a digital public good like "Aadhar" for efficient and effective scheme/service delivery to the farmers. It will be built in a 'federated architecture' as a collaborative project between the various agencies of the Central and State Governments and the Union Territories. It consists of three foundational registries or databases in the agriculture sector, i.e., the Farmers' Registry, Geo-referenced village maps and the Crop Sown Registry, all created and maintained by the State Governments/ Union Territories. Various support registries such as Crop registry, seed registry, fertiliser registry, pest registry etc are also being build. The Agri stack will provide a comprehensive profile of every farmer, irrespective of their primary occupation. By integrating data from various sources, including State databases, farmer registrations, and other Government programs and schemes, it will provide a 360-degree view of a farmer. This will enable the Government to provide services to farmers more transparently and effectively.

3.2. Key Features of AgriStack

3.2.1. AgriStack will enable farmers to authenticate their identities, verify assets, and conduct agricultural transactions digitally, enabling them to benefit from agricultural schemes and services without lengthy documentation.

3.2.2. The crop-sown data will provide reliable and timely estimates of crop area.

3.2.3. The Aadhar-verified Farmer ID, linked dynamically to the digitized land records and crops sown, would aid hassle-free procurement of crops at MSP, paperless and contactless crop loans, transparent and efficient crop insurance claims and compensation for crop loss due to natural calamities, personalized services to the farmers for crop planning, agri-input availability, and advisories on pests and diseases.

3.2.4. AgriStack will enable the Government to provide services to farmers more transparently and effectively.

3.3. Foundational Registries of AgriStack

The three (3) foundational registries of AgriStack are elaborated as under:

3.3.1. **Farmer's Registry / Database**

The Farmer's Registry is a dynamic, accurate, and verified database of farmers created and managed by the States/ Union Territories. It will provide comprehensive and useful data on farmers comprising authenticated demographic details, land holdings, family details, crops sown, soil health, livestock owned, fisheries assets, and other vocations.

3.3.2. **Geo-referenced Village Maps**

Geo-referencing of village maps is being done under the Digital India Land Records Modernization Programme of the Department of Land Resources (DoLR), Government of India. Geo-referenced Village Maps are required for conducting digital crop surveys. The geo-referenced village maps will enable trustful ground truth data collection and mapping of the data points at the land parcel level during the Digital Crop Survey exercise, geography-based crop advisory system, etc. Survey-level geo-referenced village cadastral maps will serve as a base for the above objectives. Once DoLR completes the Geo-referencing under the Digital India Land Records Modernization Programme, these maps will be used to conduct the Digital Crop Survey.

3.3.3. **Crop Sown Registry or database collected through the Digital Crop Survey (DCS) System**

A Digital Crop Survey (DCS) System will be established to collect crop-sown details through a mobile interface, ensuring data is captured directly from the field. This database will provide accurate, real-time crop area information for every agricultural plot, aiming to replace traditional survey methods like Girdawari. The DCS system will also enhance remote sensing capabilities for seamless crop area mapping, reducing the need to conduct surveys in the future.

The DCS system leverages advanced technologies like visual and advanced analytics, GIS-GPS, and AI/ML to capture accurate and time-stamped crop photos and data verified through physical inspections. A mobile interface ensures data accuracy by capturing it within plots using geo-referenced village maps and GPS. The Centralized Crop Registry standardizes crop identities while allowing states to manage local crop types.

The Government of India has developed a Reference Mobile Application for conducting the DCS. The application integrates the Land Records of Rights (RoR) data.

3.4. Master Advisory for the creation of AgriStack

3.4.1. A Memorandum of Understanding (MoU) is to be signed between the Centre and State Government to create and implement the Digital Public Infrastructure and develop a mechanism for sharing the data under the Agristack.

3.4.2. State Governments shall authenticate and maintain the State Farmer Registry/Database in accordance with Agri Stack standards.

3.4.3. The State Governments need to ensure that the Farmers Registry contains primary demographic data on farmers (such as name, age, gender, contact information and other details of the farmer as the State may deem fit) with linkage to family members, their lands (including other relationships such as land tenancy or

sharecropping, as per a State's policy) and more specific details about the farmer's agricultural activities (such as crops produced, area sown, animal rearing, fish farming, etc).

3.4.4. The registry must be dynamically linked to the land records to ensure it is updated with every land mutation.

3.4.5. Reference applications for developing and maintaining the Farmers Registry will be provided by the Central Government. The States can choose any one or both of the following approaches to create their State Farmer Registries:

3.4.6. Direct Registration by the Farmers themselves or with assistance followed by authentication from State Officials

3.4.7. Direct Authentication/validation by State officials through the camps organised at the village level by District Administration.

3.4.8. A unique 11-digit Farmer ID will be generated for each landholding farmer, facilitating nationwide identification and authentication for accessing government schemes and agricultural services.

3.4.9. States must undertake Geo-referencing of village maps separately to conduct the Digital Crop Survey.

3.4.10. To carry out the tasks related to AgriStack, the States will set up a State Project Monitoring Unit (SPMU) and Help Desk in accordance with the directions of the Government of India.

3.5. Stages of Creation of State Farmers Registry / Database

To ensure smooth rollout of the Farmers Registry across all States in India, a structured approach outlining roles, expectations, pre-conditions, and responsibilities is imperative. This includes identifying and training administrative staff at all levels (State, District, and Taluka), conducting proofs of concept, and orienting farmers, farmer services assistants, i.e., Sahayaks, operators, and other individuals and groups. Handbook on creation of Farmer Registry issued by DA&FW is to be referred for detailed process of creating Farmer Registry. However, the 6 Stages recommended for creation of a Farmer's Registry are elaborated in this section.

3.5.1. **Stage 1: State's Readiness for Building the Farmers Registry**

(a) Once the Central Government's communication regarding the Farmer Registry is received, the State should create an overarching mechanism in the form of a joint committee of Revenue and Agriculture officials to coordinate and collaborate among different stakeholders and facilitate faster decision-making.

(b) To ensure the State's readiness, it is important to identify the State Nodal Officer (preferably from the Revenue Department) and nominate a State Technical Coordinator to facilitate the technical enablement.

(c) State Project Management Units – SPMUs shall act as a bridge between the Centre and the State Teams and district-level officials. They also work closely with the State officials to enable training and system rollout. While the centre provides support resources to work at the State during the initial days of system rollout, it is extremely important that the State Government onboards a PMU team that can enable successful Agri Stack operations and seamless integration with various services/ schemes.

(d) It is critical to give clear administrative direction for data sharing to enable the farmer registry. Creating a Farmers Registry requires sharing Records of Rights (RoR) data through APIs. The Central team will provide a utility for the generation of the Farmland Plot ID, also known as the Farm ID, which represents the extent of the land parcel owned by an owner. The State may use this utility as is or customize it to apply the State-specific rules of ownership to generate Farm IDs and assign them to owner extents within every Agricultural Land.

(e) To provide benefits such as KCC and crop insurance, it is essential for the schemes to know the exact extent of land owned by a farmer. For example, in the case of KCC, the banks will refuse the loan unless a farmer's land extent is provided. Agri Stack maintains owner extents provided by states from their RoR for this purpose. Hence, it is vital for the State to take a policy decision on the assignment of land extents to individual farmers explicitly, generate a Farm ID for that extent, and share the same for land bucketing through the unified land API.

(f) Additionally, States must identify schemes where Aadhaar seeding and land linkage of Aadhaar numbers has been done using Demo Authentication, preferably, and eKYC where possible. The data from these schemes can be used to further enrich the Aadhaar seeding of the land buckets.

(g) The majority of the activities are administrative in nature and require decisions at senior level. Hence, it is extremely important that senior State Government officials and the appropriately empowered nodal officer get involved in the decision process and provide their timely and apt approvals.

3.5.2. **Stage 2: RoR Data Provisioning**

(a) Once the State readiness is complete, to ensure technical readiness, the State Government/ NIC teams should generate the Farmland Plot ID (Farmland Plot Token, Farm ID). To do so, they need to port the ownership data as per the extant allocation policy decision and use the tool provided by the central government or its customized version.

(b) Once the Farm IDs are generated, the State Government/ NIC teams can share the RoR data. The sharing of RoR data is to be done by the State / NIC Team under the guidance of the Revenue Department. The data is to be shared through an API or ported directly to the State Bucketing Servers provided by the central government.

(c) In addition to RoR data, data from Aadhaar-authenticated scheme systems, which link one or more lands with the Farmer's Aadhaar (such as State DBT data), should also be provisioned to enable the seeding of the buckets with the Farmer's Aadhaar to make the bucket claim process more efficient and accurate.

(d) This bucketing database (SFDB) application is set up to enable the next stage.

(e) Thereafter, Unified Land API is to be created. This API provides owner and owned extent data along with the corresponding Farm ID, from RoR. It is to be ensured that the land API provides all the essential information, including Farm ID which is needed to enable the claiming of land by the owner (Farmer) in Farmer Registry as well as for verification of a bucket claim by a Farmer.

(f) Agri Stack will utilize the Unified Land API, which will cross-verify the bucket concurrency with the Record of Rights (RoR) database in real time. This will confirm whether a particular piece of land still belongs to a farmer through a simple Yes or No response.

3.5.3. **Stage 3: Bucketing**

(a) Land bucketing is a concept that creates a pool of all plots owned by a single farmer in a village. The combination of Father Name and Farmer Name is used to identify a Farmer, and all the plots in a particular village owned by the Farmer are populated into a virtual 'bucket' using a bucketing software tool. This bucketing tool uses fuzzy logic to match the names using a Name Match tool developed by CDAC.

(b) The advantage of using a bucket to add lands is two folds:

i. A farmer will not need to remember all his lands and claim each one from RoR separately.

ii. Linking scheme-based Aadhaar from PMFBY/PMKISAN, etc., to the bucket makes it easy for Farmers to claim their Buckets without having to identify their lands. As soon as a farmer does this, Aadhaar seeded buckets are automatically shown to him for claiming.

iii. The Bucketing process occurs in a Bucketing Database (SFDB) and is done using a bucketing tool. The tool groups the lands belonging to a farmer based on the name match.

iv. Bucketing, in general, is a very hardware-intensive activity that requires powerful computer processing capacity to run smoothly and complete. It takes around 12 minutes on a high-end server to create buckets in one village. Hence, to cover the data of close to 55,000 villages in a month, one needs to run the tool in parallel on 20 different servers.

v. Ideally, the bucketing can be done by the State technical teams themselves, but owing to the capacity constraints, the Centre has a dedicated team to undertake this activity at the direction of the states, where technical team

and infrastructure are made available for this one-time activity. The decision to use the same is taken by the states.

vi. While bucketing is in progress, State Farmer Registry Web and Mobile Reference Applications for the State are integrated with the unified Land API of the State and kept ready for rolling Farmer Registry claiming software.

vii. Following the completion of the bucketing activity, all the bucket data is migrated to the live State Farmer Registry.

viii. The central team shall work with the State technical teams under the guidance of state officials to configure the Farmer Registry with state-specific workflow rules, approval structure and user roles.

ix. Using the PMKISAN data, draft Farmer IDs will be created district by district for all Farmers who currently are availing PM KISAN benefits, to shorten the Farmer bucket claiming time and optimize the bucket claim process.

Guidance for Bucketing

Bucketing is grouping of lands for a given farmer, which is based on state RoR data. Land bucketing is done centrally, to enable creation of unique Farmer IDs. The primary objective of creating bucket ids involves a comprehensive matching of farmers' names using a proprietary algorithm. Farmers with matching names (where the name match score is greater than a specified threshold) will be grouped together. Following this grouping, the system will cross-reference these entries with Aadhaar numbers from various government scheme databases. This process ensures the accurate and efficient assignment of Temp FIDs to farmers.

The process of Temporary Farmer ID creation majorly involves the following after data acquisition:

i. Applying data cleaning rules to the acquired datasets
ii. Matching the clean data with RoR data on required parameters
iii. Calculating the name match score of the matched data
iv. Generating the draft temporary farmer ID
v. Populating the Aadhaar from available data sources
vi. Generating village-level farmer list.

3.5.4. **Stage 4: Field Activity Planning**

i. Technology solution alone does not ensure the success of the Farmer Registry; the entire field activity needs to be planned carefully, as per the State's socio-political constraints. The planning and preparatory activities are described in the current section.

ii. At the onset, the State needs to identify the districts where they plan to pilot the system first, before going for a State-wide rollout. The selection can be done based upon the accessibility to the district, presence of the right set of officials within the district, presence of crop survey data to enable provisioning of attractive benefits such as the KCC.

(c) Once the districts are identified, the State needs to build a strategy for the campaign. This includes the departments and users who would be involved in the Registry activities, their levels and responsibilities, the locations within the villages where the Farmers' bucket claim and consent would be collected, the type of physical and IT infrastructure needed, the required involvement from various officials and the public, etc.

(d) The Strategy needs to be communicated to the various Stakeholders across levels – the communication should include a clear definition of the need, the required involvement and participation from officials, the timeframes and the various help and support that would be rendered to them.

(e) In parallel, the state identifies the Master Trainers, who will understand the system and its operations thoroughly and be responsible for training the District, Sub-district, and Village officials.

(f) A district-level committee also needs to be formed to effectively coordinate and monitor field farmer ID issuance activities.

(g) The individuals identified as Master trainers are given user training; these officials are then given appropriate access to the training environment, along with the required training material to train the trainers and the officials.

(h) The production system is then configured for various approval workflow rules; user IDs are created and linked to various district, sub-district, and village-level officials who will participate in the campaign.

3.5.5. Stage 5: Bucket Claiming and Issuance of Farmers ID (Go-Live)

(a) State officials who have been identified and trained on the system will participate in the campaign and enable the bucket claiming and consent of all Farmers across the State. The states may choose to do this exercise in a phased manner, i.e., division by division, district by district, and/or whole state.

(b) The State should design and implement APIs tailored to state schemes and AgriStack to integrate them with the Farmer Registry System. These integrations include attractive schemes such as the Kisan Credit Card (KCC), crop insurance, etc. Furthermore, integration testing should be conducted to ensure optimal performance.

(c) A pilot with live farmers needs to be executed for scheme benefit provisioning. After Farmer ID issuance, farmers can be encouraged to apply for these schemes (e.g., KCC) and avail themselves of instant benefits. This benefit availment would encourage a higher level of farmer enrolment in the Farmer Registry.

(d) This pilot can be followed by a Statewide integration with the Schemes that have been successfully piloted.

3.5.6. Stage 6: Sustenance of State Farmer Registry Post-Go-Live

(a) After the go-live stage, a mechanism needs to be established for automatic updation of the Farmer registry with mutation updates done in State RoR. This will ensure that the Farmer registry is live with current and correct records of farmers. (The central team has developed scripts for this purpose, which would enable regular updates of farmland plot data and farmer linkages in RoR.)

(b) The State shall build State-level capacity for the long-term sustenance of the State Farmer Registry.

(c) The Farmer Registry is to be managed and monitored continuously to ensure its accuracy and effectiveness. The State will independently take over its operation and maintenance.

3.6. Geo-Referenced Village Maps

3.6.1. The objective of Geo-referenced Village Maps (GRVM) is to establish a comprehensive database of cadastral maps digitally encoded with geographic information system (GIS) technology. Geo-referenced Village Maps are essential for collecting verifiable and truthful crop-sown details in every season through a digital crop survey system. The Department of Land Resources (DoLR), Government of India, is implementing a project to create Unique Land Parcel Identification Numbers (ULPIN) in the country. For this purpose, DoLR is developing geo-referenced village maps under the Digital India Land Records Modernization Programme. Details of the Geo-referenced process have been given on the Department of Land Records (DoLR), Government of India's website.

3.6.2. GRVM involves the creation of GIS-ready digitized maps of revenue village cadastral, encompassing digitization in three layers: point, line, and polygon. The project aims to enable seamless integration with land records, facilitate precise area calculation, and allow for future corrections. The scale and accuracy target is set at 1:4000, ensuring reliability and dimensional accuracy.

3.6.3. The infrastructure for GRVM requires GIS software for digitization and geo-referencing, high-resolution satellite imagery for spatial accuracy, and IT systems for quality assurance and data integration. The Ministry has developed a mobile application to check the accuracy of Geo-Referencing for the purpose of Digital Crop Surveys. States may use this application to check the accuracy of Geo-referencing.

3.7. Crop Sown Registry through Digital Crop Survey

The Digital Crop Survey (DCS) enables the capture of crop information for each farmland plot from within the plot's boundary. For conducting the DCS, Central Reference applications are developed, and the States' RoR data is integrated into the application. The system takes farmer and farmland data (from RoR) and Geo-referenced map data to generate a map of owner plots and records the crop sown information against the owner plot. The State Governments would either use the Central Reference Application or the State Application (provided data format is as per the Centre's guidelines) to conduct the DCS in their State with the help of the village-level assistants/ residents/ farmers who act as surveyors, verifiers for performing the crop survey activities.

3.7.1. Objectives of Digital Crop Survey (DCS)

The DCS is a crucial component of the broader Agri Stack Project, which seeks to digitize and streamline agricultural crop survey processes. The objectives for conducting digital crop survey are:

(a) To support decision-making processes with reliable data, aiding in policy formulation and risk management.
(b) To facilitate access to agricultural services like credit and crop insurance by providing verified details of the farmer's land, the area of the farmland and the crops grown.
(c) Improve soil health management through targeted interventions and promote sustainable agricultural practices.
(d) Facilitate personalized advisories to farmers, helping them make informed decisions.
(e) For accurate crop estimation and providing ground truth information for better market planning and price stabilization.
(f) To create a digitally enabled, resilient agricultural ecosystem in India, benefiting farmers and stakeholders alike.

3.7.2. Time Required for Conducting DCS

The Digital Crop Survey System is an initiative of the Union Government with the participation of States. The uniqueness of this project, as far as execution is concerned, stems from the fact that the crop survey is a time-limited operation and must be completed within about 45 days from the day of initiation. Generally, a Crop Survey starts in a tehsil/taluka or a village one month after the crop is sown and should be completed about 15 days before the harvest.

The quantum of work is large in terms of manpower involved. Hence, it is important that the State and central governments make all preparations in tandem when implementing DCS. While the crop survey work will be done entirely by the State Government, it is the responsibility of the Centre to support the State initiative in every possible manner.

3.7.3. Operational Mechanism for Digital Crop Survey

This section summarizes operational and administrative guidelines and existing advisories shared with the States that have conducted DCS or will conduct DCS in the next cropping season.

(a) **Key Pre-requisites for the States on-boarding for DCS**

i. **Proposal Submission**: States must submit their implementation proposals alongwith Annual Action Plan under Krishnnonati Yojana.
ii. **Nodal Officer Nomination**: States should appoint a Nodal Officer to lead DCS implementation and facilitate coordination with the Centre.
iii. **Master Trainers Identification**: States must identify Master Trainers for each district, with action plan for training.
iv. **IT System Preparation**: Essential IT infrastructure must be in place two weeks before the DCS start date. This includes SSL certificates, bandwidth, and storage requirements.

(b) **Operational Mechanism**

i. States must geo-reference village maps and digitize land records (RoR) before conducting digital crop surveys.

ii. Surveys will be conducted for each agricultural plot once per season (Kharif, Rabi, and Summer, if applicable).

iii. Data will be captured using a Digital Crop Survey Mobile App, which will be shared between the Centre and the State as per the MoU signed on Digital Public Infrastructure (DPI). Data will also be shared with State Agricultural Statistics Authority (SASA) for Crop Area Estimation.

iv. As per MoU, State will share following data with the Centre w.r.t. DCS through API:
    a. Village level aggregated DCS data for crop area estimation.
    b. Parcel level crop data for service/ scheme delivery to farmers.
    c. Anonymized parcel level crop data for Geo-spatial use.

v. States can use Government officials or Krishi Sakhis or private persons, including farmers, for the surveys, ensuring they are knowledgeable about local agronomy.

vi. Surveyors will log in to the DCS mobile app and access assigned surveys and land parcels for which data is to be recorded. The mobile app uses GPS to locate surveyors within designated land parcel boundaries, ensuring accurate data capture within the specified survey area.

vii. Surveyors will visit each plot, using the mobile application to capture crop details, irrigation sources, etc., geo-tagged and time-stamped photographs, and cropped areas.

viii. The Principal Secretary/ Director (Agriculture/Revenue), as designated by the State will be the Single Point of Contact (SPOC), and a Technical Nodal Officer (TNO) will be appointed for technical oversight. SASA officials are to be involved for supervision & other related activities of conducting DCS. A web portal allows supervisors to review survey details captured by surveyors, ensuring data accuracy and completeness before submission.

3.7.4. Stakeholder's Roles and Responsibilities

(a) Central Government

The Central Government will provide a draft of recommended roles and responsibilities for each stakeholder involved in the project. This includes State and local officials such as the State Chief Secretary, State Development Commissioner, State Revenue Secretary, State Agriculture Secretary, Collector/Deputy Commissioners, Tehsildars, Agriculture Officers, Taluka Agriculture Officers, Village Agriculture Officers, and Village Accountants/Patwaris.

The successful execution of the Digital Crop Survey (DCS) requires the Central Government to undertake several key responsibilities. These responsibilities are categorized under IT System Preparations and Manpower and Training.

(i) IT System preparation

- **Crop Survey Mobile and Web Application:** States can use their own apps after incorporating mandatory features or the central app provided by the Ministry. States need to configure the Reference app with parameters such as the start and end of the season and Taluka names. Additionally, States must link their land records and georeferenced maps to the Crop Survey Application. The Centre will provide documentation and support for this integration.
- **User Manual:** The Central Government will supply a user manual in English, and States are responsible for translating it into the local/official language.
- **Training Documents:** The Central Government will prepare training materials (videos, PPTs, manuals) in English. States must translate these materials and distribute them to all concerned parties.
- **Training Apps:** The Central Government will provide a mobile training app that mirrors the actual Crop Survey App. This app will help users familiarize themselves with the application.

- **Video-based User Manual:** The Central Government will create instructional videos covering different aspects of the crop survey process. These videos will explain the philosophy, importance, and implementation of crop surveys and land records.
- **Helpdesk:** States should establish a helpdesk to assist crop surveyors and supervisors with technical and operational issues. The Central Government will offer guidance on setting up the helpdesk.
- **Technical Support Team:** States must ensure the project's technical management by provisioning the necessary systems, software, and hardware. The central government will provide recommendations on the required manpower for technical support.

(ii) Central Program Management Unit (CPMU Team)

The CPMU Team deployed at DA&FW is to coordinate between the technical support team, development team, and department head. They track issues, monitor bugs, and manage change requests.

(b) State Government

The successful execution of the Digital Crop Survey (DCS) requires comprehensive preparation by the States, outlined in a Readiness Matrix divided into two main parts: Preparatory Work for the IT System and Manpower and Training.

(i) Preparatory work for IT System

- **Provisioning hardware and software:** States must ensure the required hardware and software are provisioned in the State Data Centre or Cloud, as specified by the Ministry. This includes ensuring robust systems to handle peak data loads during simultaneous uploads by crop surveyors.
- **Technical Support:** A dedicated technical team, including database and system administrators, must be established to support the crop survey operations.

- **State Level PMU (SPMU):** The SPMU should comprise administrative staff from agriculture, revenue, and horticulture departments, and technical staff for managing database and system administration, debugging software, and coordinating with the help desk. Funding provision for setting up the SPMU is provided under the administrative funds under PM KISAN.
- **Data Preparation**: Essential datasets, such as Land Record Data (ROR) and Geo-referenced Village Maps, must be prepared and integrated into the crop survey system to ensure data accuracy and compatibility with LGD codes.
- **Village Map Shape Files and Index Data**: States must provide the necessary shape files and index data for geo-referenced maps to the crop survey application.
- **IT System Architecture**: States should determine the optimal configuration of web and database servers to manage system load, with guidance from the Agri Stack Software Team and NIC Karnataka Team.
- **Master Data Registries**: States must compile various master data registries, including Crop Master, Irrigation Sources Master, and Land Use Master, following upcoming circulars.
- **District Taluka Village Master**: Finalize these masters according to LGD Codes.
- **Translation of Training Materials**: Translate training materials, user manuals, and videos provided by the Central Government into the local/official language.
- **User Acceptance Test (UAT):** Conduct UAT in the actual hardware and software environment to identify and resolve potential issues before project commencement.

(ii) Manpower and Training

- **Master Trainers:** Master trainers are crucial for training district-level trainers, crop surveyors, and supervisors. The Central Government will

guide the number and roles of master trainers, and representatives will visit States to assist with their training.

- **District Trainers:** District trainers support crop surveyors and supervisors and helping resolve issues during the 45-day survey period. Each district trainer should oversee no more than 20 surveyors to ensure effective management.

(iii) Setting up the State PMU (SPMU)

The Digital Crop Survey (DCS) is a significant initiative designed to survey crores of agricultural plots across all villages in a State within a tight timeframe of about 45 days. This large-scale operation requires simultaneous surveying in numerous villages, ranging from 20,000 to over 1,00,000 per state. To achieve this, an extensive number of crop surveyors are needed, ideally one per village, drawing personnel from various government departments, including Revenue, Panchayati Raj, Agriculture, Horticulture, Sericulture, and Animal Husbandry. The survey may also involve local youth under the supervision of these officials, necessitating substantial inter-departmental collaboration. The successful execution of this project involves addressing numerous administrative issues and ensuring effective coordination among the departments, which is managed by the State Project Monitoring Unit (SPMU).

The SPMU plays a central role in the DCS and the Farmers Registry, overseeing daily operations, resolving software and data quality issues, and ensuring timely communication and problem-solving among field officials and crop surveyors. It comprises a Project Head, supported by officers from different departments, domain experts, an IT consultant, and administrative staff. The Project Head is responsible for high-level supervision and reporting to senior government officials. The PMU also organizes State Level Committee meetings and ensures that surveyors receive their honorarium promptly. Unlike the Help Desk, which provides day-to-day technical support for field operations, the SPMU controls and supervises Help Desk activities.

The SPMU's services, set up for the Farmers' Registry with administrative funds under PM KISAN, may also be utilized for DCS.

The Technical Support Team handles complex technical issues and supports users by:

i. Issue Verification: Confirm and understand escalated issues.
ii. Remote Support: Investigate and resolve issues via remote access.
iii. Data Backup and Restoration: Assist with data recovery.
iv. Village TPK Map Verification: Ensure data accuracy by cross-verifying survey numbers.
v. Web Application Support: Resolve web application issues.
vi. Issue Tracking: Maintain and forward unresolved issues for further investigation.
vii. Liaison with Officers: Gather feedback and relay it to the department head.
viii. Coordination and Mediation: Facilitate communication between the Help Desk, Development Team, and department officers.

3.7.5. Helpdesk

The Help Desk is designed to provide timely information and resolve issues that arise during the Crop Survey. It aims to address queries from farmers, surveyors, and government officials within 5-15 minutes of registration. The DCS Helpdesk advisory has the following salient features.

(a) Roles and Responsibilities of the Helpdesk

The Help Desk team supports the Crop Survey Application through various activities, using CRM software to manage and allocate incoming calls. Key responsibilities include:

i. Application Guidance: Provide step-by-step guidance and assistance to users.
ii. Remote Support: Utilize tools like Team Viewer or any desk to offer remote support.
iii. Virtual Training: Conduct training sessions to enhance user proficiency.

iv. Account Management: Manage user accounts, enabling or disabling them as needed.
v. Device Compatibility: Ensure mobile devices are compatible with the application and guide users on necessary settings.
vi. Application Settings: Assist with downloading, installing, and configuring the application.
vii. Data Download: Help surveyors download essential master data.
viii. Training on New Requirements: Conduct sessions on new features and functionalities.
ix. Escalation to Technical Support: Forward unresolved issues to the Technical Support Team.
x. Data Gathering: Collect information on defective village maps for further analysis.

(b) Helpdesk Structure

The Help Desk consists of:

i. **Tele-executive Operators**: To interact with users, provide guidance, and resolve issues promptly.
ii. **Team Leaders/Managers:** To oversee operations, monitor performance, and provide training and support
iii. **Subject Matter Experts**: To offer advanced knowledge and solutions for specialized issues.
iv. **State Technical Support Team**: This team addresses technical problems, assists with data backup, verifies village maps, and supports web applications.

3.7.6. Escalation Matrix

A structured mechanism ensures timely issue resolution:

(a) **Tele operator Assistance:** Aim to resolve issues within 5-15 minutes.

(b) **Technical Support Team:** Handle escalated issues within 3 hours using remote desktop tools.

(c) **Subject Matter Expert (SME):** Provide specialized guidance within 3 hours if needed.

(d) **Daily Issue List:** Maintain and share a list of unresolved issues for effective monitoring.

(e) **Communication with Department Head and Development Team:** Inform stakeholders of ongoing issues and change requests.

(f) **CPMU Team:** Coordinate issue tracking, monitor bugs, and discuss change requests with the Department Head.

4. Krishi Decision Support System (Krishi-DSS)

4.1. About Krishi - DSS

Krishi-DSS, launched on 16th August 2024, integrates and standardizes geospatial and non-geospatial data, including satellite, weather, soil, crop signatures, reservoir, groundwater data, and government scheme information. Krishi-DSS offers crop maps, soil maps, automated yield estimation models, drought/flood monitoring systems, etc., which support the government's evidence-based decision-making and facilitate innovative solutions by research institutions and the agritech industry. This Krishi-DSS platform is aligned with the government's National Geo-Spatial policy. The information available on Krishi-DSS would support crop map generation for identifying crop sown patterns and crop diversification, drought/flood monitoring, and technology/model-based yield assessment for settling crop insurance claims by farmers.

4.2. Collaborative Approach for Krishi Decision Support System

Krishi Decision Support System (Krishi- DSS) is a prime example of a collaborative platform that follows the whole government approach with participation from multiple Ministries, Departments, and organizations, where multiple data sources are seamlessly exchanged to enhance agricultural decision-making. This system integrates a wide array of data types, including weather information/forecasts, soil information, satellite imageries, reservoir levels, groundwater data, Field information, etc. These datasets are sourced from various organizations - Weather data from the Indian Meteorological Department (IMD); Reservoir levels and groundwater data from the National Water Informatics Centre (NWIC) of the Department of Water Resources, RD & GR; Soil data from Soil and Land Use Survey of India (SLUSI); and Field information collected by MNCFC, DA&FW and the State agencies. Open-source satellite imageries are also integrated into the platform.

Collaboration has been done with the Space Application Center (SAC), Ahmedabad, for the implementation of Crop yield models and drought Modules through Krishi-DSS. SLUSI has been involved in developing a soil-related module on K-DSS. The WINDS platform, which is being developed in association with IMD for weather-related information, will also be integrated into Krishi-DSS.

Through its advanced modular architecture, Krishi DSS facilitates the continuous exchange of these diverse data sets, which are processed and analyzed to generate actionable insights for farmers, researchers, and policymakers. The collaborative nature of Krishi DSS is evident in its ability to consolidate and harmonize data from disparate sources into a unified platform. The system includes modules for crop monitoring, yield estimation, insurance solutions, and advisory services.

4.3. Operational Mechanism for Krishi Decision Support System (Krishi-DSS)

4.3.1. **Data Integration and Accessibility:** Krishi DSS integrates data from central, state, and research/institutes, providing different access levels based on the data's sensitivity. There are three access levels: A1 (Central data open access), A2 (State-specific data with limited access), and A3 (Central and State data with restricted access).

4.3.2. **User Groups and Privileges:** Different user groups will have varying access levels. Farmers can access farm-specific data, while government officials will have access to aggregated data.

4.3.3. **Training and Capacity Building:** After deployment, state and central employees will receive training to utilize the Krishi DSS effectively. This includes hands-on training on the software's functionality and processes.

4.3.4. **Collaborative and Secure Framework:** The platform will allow for collaborative decision-making and, with strict data security and privacy measures, integrate with various data sources for seamless data flow and management.

4.4. Responsibility for the development and monitoring of Krishi - DSS

4.4.1. Director MNCFC will be the nodal officer for the conceptualisation, development, operation, and maintenance of Krishi-DSS, with the support of the Project Implementation Committee (PIC) and officials of the Department of Agriculture and Farmers Welfare.

4.4.2. A Strategic PMU consisting of resources with requisite expertise shall be established at MNCFC to oversee the development and monitor the functioning of Krishi DSS.

4.4.3. The States are advised to set up PMUs at the state level for operations, maintenance and utilisation of the Krishi-DSS platform.

4.5. Role of the State Governments

An integrated agriculture platform that includes a decision support system is being built by the Centre to serve as a reliable system for agricultural-related applications. The States may use the reference application and refer to the standard operating procedure for developing and utilising the standardized data available in Krishi-DSS. States will be given access to Krishi-DSS where states may customize the rules and APIs or build their own, ensuring essential features prescribed by the Central Government.

5. National Soil Mapping Programme (NSMP)

5.1. About the Project

5.1.1. A Nationwide Soil Resource Mapping project has been initiated by the Soil and Land Use Survey of India (SLUSI), which is inventorying soils at a village level on a finer and more detailed 1:10,000 scale using high-resolution satellite and ground data. Under this project, a detailed soil profile study will be carried out to create standardized soil maps for rational land use and crop planning, thus promoting sustainable agriculture.

5.1.2. Presently, SLUSI, with 52 soil survey parties spread across the country, has the capacity to survey and map about 10 m ha of land annually. Each soil survey party can survey about 1.5 to 2.0 lakh acres annually, depending on the terrain/study area. For the execution of this project, the soil survey, remote sensing, GIS, and soil analysis lab facility of SLUSI needs to be further strengthened and augmented.

5.1.3. **Key objectives of the project include the following:**

(a) To prepare a detailed soil resource inventory of the country's agricultural lands on a 1:10,000 scale at the village level for soil health management, sustainable agriculture and crop planning.

(b) To carry out a detailed soil survey and soil profile study of the soils of India for their characterization, classification (based on universally accepted taxonomy), mapping, and interpretation for rational land use planning using remote sensing, GIS techniques, ground survey, and soil analysis.

(c) To build a digital soil resource database useful for Decision Support System in Agriculture (Krishi-DSS) as a part of the development of a Digital Agriculture Ecosystem in the country for the benefit of farmers, policymakers, academia and researchers.

5.2. Responsibility of SLUSI and other Organisations

5.2.1. The Soil and Land Use Survey of India (SLUSI), New Delhi, a subordinate office under DA&FW, will be the nodal agency for the National Soil Mapping Programme.

5.2.2. The infrastructure related to soil survey, soil testing, remote sensing, and lab and GIS facilities available with SLUSI will be used to execute this project. Under Digital Agriculture, the infrastructure of SLUSI will be further strengthened and augmented for the execution of this project.

5.2.3. SLUSI will undertake the soil survey work through its seven regional centres located across the country: Ahmedabad, Bengaluru, Hyderabad, Kolkata, Nagpur, Noida, and Ranchi.

5.2.4. The support of other organizations like ICAR, NBSS&LUP, NRSC, ISRO, State Remote Sensing Application Centres, State Agriculture Universities, Research Institutes, and other Central and State agencies engaged in soil survey and mapping will also be taken.

5.3. Operational Mechanism

5.3.1. To complete the entire country's soil mapping task with a participative approach, the support of other organizations like ICAR, NBSS&LUP, NRSC, ISRO, SAUs, and other Central and state agencies will be taken. About 26 million ha area will be carried out by these partner institutes in the next two years, i.e. FY 2024-25 & 2025-26.

5.3.2. For fixation of cost norms of soil survey & mapping and National Soil Mapping Programme (NSMP), 1:10K through partner institutes/organizations, a committee of the DA&FW has been constituted under the chairmanship of DDG, NRM (ICAR) along with expert members from various organization like SLUSI, DA&FW, ICAR, NRSC, ISRO, State Agricultural Universities, State Remote Sensing Application, and the Centre and the State Govt Departments. The organizations (Partner Institutes like SAU, State RSAC etc.) selected and allocated the soil mapping work

under this project will undertake the work for the allotted geographical area at the rates fixed by DA&FW based on the recommendation of the committee.

5.3.3. The operational procedure of this project comprises a group of interlinked operations involving the following tasks:

(a) **Satellite and thematic data Integration and interpretation:** This involves high-resolution, multi-spectral satellite data and reference data integrations and interpretation.

(b) **Pre-field interpretation map:** This would involve preparing a soil physiography map and a pre-field interpretation map, which will help in preparation before the soil survey and fieldwork.

(c) **Soil survey and fieldwork:** Soil Profile examination by digging pit/vertical cross-section of soil up to 1-2m/bedrock will be conducted to study the important properties/characteristics of soils and associated land features.

(d) **Laboratory analysis:** To support and supplement the field observations and soil sample analysis for different chemical and physio-chemical soil properties and fertility status.

(e) **Using a standardised soil classification system, the correlation and classification** of soils into defined taxonomic units.

(f) **Derivative map preparation:** This involves establishing and drawing the soil boundaries of different kinds of soils on standard topographical base maps. Post-field interpretation will be performed using satellite data and legacy thematic data. Land capability, soil-site suitability for various crops, and land irrigability will be mapped through derivative map preparation.

(g) **Soil survey interpretations:** Different derivative maps from the soil maps will be prepared, such as land capability maps, soil-site suitability maps for different crops, and land irrigability maps.

(h) **A digital soil resource database** will be prepared using standard protocols. It will be helpful for the Decision-Support System in Agriculture (Krishi-DSS) and benefit farmers, policymakers, academia, and researchers.

5.4. Project Deliverables

5.4.1. **Spatial Data:** High-Resolution Soil Maps

5.4.2. **Soil Type Distribution Maps:** Detailed maps showing the spatial distribution of different types of soils occurring in the country.

5.4.3. **Soil Property attributes and maps:** Maps will contain soil properties as attributes attached to soil mapping units related to morphological, physical, and chemical properties such as slope, soil depth, texture, structure, pH, EC, organic matter content, cation exchange capacity, exchangeable bases (Ca, Mg, Na, K), Base saturation, nutrient levels etc.

5.4.4. **Soil Health Indicators:** Data on soil pH, Electrical conductivity, organic carbon content, nutrient levels (N, P, K), micronutrients and other indicators of soil health and quality.

5.4.5. **Derivative maps:** Land capability, Soil-site suitability for different crops etc.

5.5. Project Timelines

Under the Digital Agriculture Mission, Soil mapping is proposed at the national level, covering the entire agricultural land of the country in five years. The total area to be covered for soil profiling at a scale of 1:10000 is 142 million ha. The Soil and Land Use Survey of India has already surveyed and profiled soils in about 29 million ha of the country. The state-wise area covered under the Detail Soil Survey and Mapping by SLUSI is provided in Annexure-I. The remaining agricultural land survey will be undertaken to prepare soil profile maps for the entire country in the next five years, as follows:

Particulars	1st year	2nd year	3rd Year	4th Year	5th Year
National Soil Mapping Programme at 1:10K scale	112 districts (110 Lakh ha)	153 districts (235 lakh ha)	100 districts (285 lakh ha	149 distric (235 lakhs ha	147 districts (255 lakh ha)
• Selection of districts based on agricultural area covered under districts • Assuming 100 number of soil survey parties (with hired manpower for 5 years) • Soil Analysis: SLUSI Labs + Research Institute/Scholar, SAUs student PG/Ph.D etc.					

6. Digital General Crop Estimation Survey (DGCES)

6.1. About DGCES

6.1.1. Crop statistics information is the backbone of the Agricultural Statistical System. The availability of reliable and timely crop estimates is crucial for important policy decisions on pricing, procurement, storage, transportation, marketing, export/ import, public distribution, and compilation of GVA in the country.

6.1.2. There are two components in crop statistics. First is crop area, and the second is crop yield. The crop area statistics is product of official statistics generated out of Land Record system and is primarily maintained by State Revenue Departments. The crop-wise area submitted by the States/UTs during Kharif & Rabi seasons, as per schedule of release of advance and final estimates, is aggregated and validated to arrive at National level figures of area sown of major crops. Crop-wise yield is estimated through a national programme called General Crop Estimation Surveys (GCES). Under GCES, Crop Cutting Experiments (CCEs) are conducted by States/UTs using a scientifically proved sampling methodology. Under GCES, the CCEs are conducted in randomly selected fields by randomly locating a plot of a specified size, harvesting, threshing, weighing and recording the weight of the produce from the plot. The State governments are responsible for collecting the agricultural data and implementing sample surveys for yield estimation through GCES.

6.1.3. Previously, the process of recording and generating yield estimates was completely manual in States/ UTs except for a few States, resulting in delays and manual errors. This led to the introduction of Digital General Crop Estimation Surveys (DGCES). DGCES has re-engineered the existing process of General Crop estimation survey (GCES) with an infusion of advanced technologies to improve the quality of crop-cutting experiment data and enhance the accuracy of crop yield estimation. DGCES aims to standardize the CCEs across the country

using a digital platform to achieve:

(a) Improved data quality and accuracy of CCEs

(b) Robust and real-time monitoring of the process

(c) Real-time data analysis and Yield estimation

6.1.4. DGCES is designed to streamline and automate the entire GCES process, encompassing state-level planning, recording the results of CCEs conducted on the field, and report generation. By digitizing and enhancing the efficiency of CCEs, DGCES seeks to provide States/ UTs with crop yield data that is not only accurate but also accessible in a timely manner.

6.1.5. DGCES was pilot implemented during Kharif 2023 in selected districts of 10 States: Uttar Pradesh, Punjab, Haryana, Odisha, Rajasthan, Gujarat, Kerala, Tamil Nadu, Himachal Pradesh, and Bihar. In Rabi 2024, it was implemented in all districts of 16 major States. From Kharif 2024, DGCES will be rolled out in all the major States/UTs of India.

6.2. Infrastructure

6.2.1. The Ministry will provide a DGCES mobile application for recording CCE results directly from the field, along with a DGCES web portal.

6.2.2. Registration of primary workers, crop-wise and season wise CCE plan upload/ generation, crop area upload, implementation progress tracking and data approval etc. need to be done through the web-portal. DGCES mobile application will be used primarily for CCE data collection by the primary workers.

6.2.3. Implementing states, during each crop season, are required to generate/ upload the CCE Plan exclusively as per the methodology of GCES on the Web Portal well within the prescribed time. This will facilitate primary workers and States/UTs getting the relevant information on time. The registration of primary workers is a one-time exercise. However, modification can be done in case of transfer and posting of primary workers.

6.2.4. States that have developed their own CCE applications under GCES may either opt to use the DGCES mobile and web portal provided by the Ministry or continue using their own applications. However, in either case, the States must ensure that their CCE applications include the essential features prescribed by the Ministry (Annexure-II).This may be modified as per requirement. A team from the Ministry will facilitate a thorough demonstration of the State/UTs own application.

6.3. Operational Mechanism

6.3.1. The departments designated as the State Agricultural Statistical Authority (SASA) in each State or Union Territory shall serve as the nodal departments for implementing and coordinating Digital GCES in their respective States.

6.3.2. If multiple departments are involved in conducting CCEs within a state, SASAs must ensure effective coordination and collaboration among them to facilitate the smooth and efficient implementation of DGCES at the ground level.

6.3.3. States must prepare a Crop Cutting Experiment (CCE) plan for all major and minor agricultural crops cultivated within their State at the start of each season for the agricultural year, strictly adhering to the GCES methodology as prescribed by the Department of Agriculture and Farmers' Welfare. The CCE plan should be entered into the DGCES web portal at the beginning of each season.

6.3.4. States shall ensure that CCEs planned under the Pradhan Mantri Fasal Bima Yojana (PMFBY) or any other crop insurance scheme are kept separate from those conducted under DGCES.

6.3.5. The Ministry will notify States of the minimum number of CCEs required per crop before generating plans through the DGCES Portal for each agricultural year. SASAs must ensure that at least the specified number of CCEs is planned for each crop.

6.3.6. SASAs and the departments responsible for conducting CCEs must approve the CCE data submitted by primary workers for all seasons of every agricultural year via the DGCES web portal preferably within 10 days of submission. CCE data can be approved through the portal's 'Data Approval Module', and both district and

state-level users may approve the CCEs.

6.3.7. Before approval, SASAs must verify the accuracy of the data submitted by primary workers. They may correct data in specific fields, provided they include justifications and upload supporting documents. States must ensure that images are correctly captured, and primary workers accurately record the produce's weight. If an experiment is not conducted according to the guidelines, SASAs must reject it. Rejected experiments will not be included in yield estimation.

6.3.8. The Ministry will thoroughly review State-approved CCE data for final approval. Only CCEs approved at both the state and central levels will be considered for yield estimation. If any discrepancies are found, the Ministry may reject the CCE. In such cases, the State must rectify the data and resubmit it for approval or they may further reject it, if not found ok.

6.3.9. States using their own applications must share plot-level CCE data with the Ministry via API, following the specified format (Annexure-III). However, parameters may be added or deleted as per requirement. States must also ensure that the CCE plan is prepared in accordance with the GCES methodology and share it with the Ministry ahead of conducting CCEs.

6.3.10. States with their own applications must approve the data before sharing it via API. It is essential to provide the data entered by primary workers, including any edits made by the State/UT (if applicable), prior to approval. The specified format is attached in Annexure – IV. However, more number of items may be included, if required.

7. IT Initiative Support

7.1. IT Initiative support to States and Other Organizations under the Mission

7.1.1. The erstwhile National e-Governance Plan Agriculture (NeGPA) scheme, which was launched as a Centrally Sponsored Scheme in 2010-11, has been subsumed in the Digital Agriculture Mission. Under this, support will be provided to the States/UTs and academic and research institutes for projects involving emerging technologies adhering to the standards of digital public infrastructure/ digital public goods, as laid down by the Government of India. All the States/ UTs across the country will be covered.

7.1.2. Funds will also be released to States and UTs for customizing and shifting their web and mobile applications to digital technology platforms.

7.2. Support available for IT-related activities of DA&FW, Government of India

7.2.1. Upgrading IT Infrastructure in the Department and other offices under the administrative control of DA&FW, such as procuring software, licenses, cyber security services, equipment, and cloud computing infrastructure, setting up and maintaining the Krishi Monitoring Support Center, etc.

7.2.2. Developing various IT Applications and Mobile Apps for the Department, including Artificial Intelligence Initiatives.

7.2.3. Support for DA&FW's compliance with NITI Aayog's initiative, viz. Data Governance Quality Index (DGQI) and various Cyber Security guidelines.

7.2.4. Support activities related to the Digital Public Infrastructure for Agriculture, wherever such funding is not explicitly provided, such as generating proof of concept and conducting pilots.

7.2.5. Support for maintaining the e-office, department's websites and mobile Apps and holding Virtual Conferences.

7.3. Infrastructure for State Initiatives

States may develop applications/Apps independently, ensuring that they are aligned with the standards of digital public infrastructure/ digital public goods laid down by the Government of India. The Centre will co-own intellectual property created during pilots, with States/UTs sharing details and outcomes.

7.4. Operational Mechanism for State IT Initiatives

7.4.1. An MoU on DPI between the Centre and the State is essential for the State to obtain financial assistance. The Principal Secretary, Production Commissioner, Secretary, or Director (Agriculture) will act as the project nodal officer.

7.4.2. **Proposal Submission**: States/UTs should submit their proposals under the annual action plan for Krishonnati Yojana, containing the DPR, financial implications, timelines, and technologies involved.

7.4.3. **Technology Utilization:** Proposals will be examined for using the latest technology, innovation, scalability, viability, and alignment with central Government DPIs before being proposed for pilot projects or otherwise.

7.4.4. **Implementation Timeline**: States/UTs are advised to propose projects with a lifecycle, preferably one year, and clear implementation timelines.

7.4.5. **Cost-Benefit Analysis and Use Cases:** States/UTs shall share details of the cost-benefit analysis required for project monitoring as well as the use cases to be deployed using the data generated/collected with a specific implementation plan.

7.4.6. **Evaluation**: DPRs will be assessed by the Digital Agriculture Division.

8. Support to MNCFC

8.1. About MNCFC

8.1.1. The Mahalanobis National Crop Forecast Centre (MNCFC) was established in 2012 as an attached Office of the Department of Agriculture and Farmers Welfare (DA&FW), with the objective of "enhancing the utilization of satellite, remote sensing, and GIS technologies in crop estimation." The Center also extends its support for drought monitoring and to the States for their capacity building on geospatial technologies for agriculture. It is the technical partner for effectively implementing PMFBY for area discrepancy analysis, smart sampling, and yield dispute resolution.

8.1.2. Advancements in geospatial technology present opportunities for MNCFC to expand its role in agricultural decision-making. Further, it has been entrusted with the additional responsibility of implementing various technology-driven initiatives under the Pradhan Mantri Fasal Bima Yojana (PMFBY). Development & maintenance of Krishi DSS system is also being undertaken by the Center.

8.2. Key Activities of MNCFC under the Mission

The key activities of MNCFC to be covered under the Digital Agriculture Mission are enlisted as follows:

(a) Crop acreage and production estimation of major crops under the scheme "Forecasting Agricultural output using Space, Agro-meteorology and Land based observations" (FASAL). It also undertakes Horticulture Crop assessments.
(b) Support to Crop Weather Watch Group, drought monitoring and support to the States for their capacity building on geospatial technologies for agriculture.
(c) MNCFC is also the technical partner for the effective implementation of PMFBY for area discrepancy analysis, smart sampling, and yield dispute resolution.

9. Financial Management and Fund Flow

9.1. Financial Assistance to States for Farmer's Registry

The State Governments shall use the administrative fund of the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) scheme to set up a Project Monitoring Unit to build the Farmers' Registry.

9.2. Funding Mechanism for (i) Digital Crop Survey and (ii) Support to States for IT initiative projects (Erstwhile NeGPA subsumed in the Mission)

9.2.1. The 'Digital Crop Survey (DCS)' and 'Support to States for IT initiatives' are centrally sponsored components under the Digital Agriculture Mission. The Mission supports the States/UTs that seek financial assistance from the Government of India to conduct surveys in all three seasons and to execute IT projects involving emerging technology adhering to the standards of digital public infrastructure/ digital public goods, respectively.

9.2.2. On signing the MoU with the Government of India for DCS, funds will be allocated to States using a standardized formula that factors in several key considerations, such as the number of land parcels and cropping intensity specific to each State as per Agriculture Census 2015-16. Likewise, an MoU on DPI between the Centre and the State is essential for the State to obtain financial assistance for IT initiative projects.

9.2.3. Conditions for approval of the proposal under Krishonnati Yojana (KY):

(a) The States/UTs will send the DCS proposal or proposal for carrying out IT initiatives through the Annual Action Plan under **Krishonnati Yojana's consolidated proposal**.

(b) The proposals for availing assistance for IT initiatives under the annual action plan for Krishonnati Yojana should contain the DPR, financial implications, timelines, and technologies involved.

(c) States need to submit proposals of DCS in the format prescribed by the DA&FW.

(d) The Proposal including Detailed Project Reports (DPRs) submitted by the States for availing financial support for carrying out IT initiatives will be assessed by the Digital Agriculture Division.

(e) States/UTs shall share details of the use cases to be deployed using the DCS data generated/collected with a specific implementation plan.

(f) Financial Assistance will be provided to the States only after they sign the MoU on DPI with the Central Government. However, the States may carry out the DCS with their own funds without signing the MoU.

(g) The Centre's fund will be released after the state shares the DCS data with the Centre through API as per the MoU:

a. Village level aggregated DCS data for crop area estimation.
b. Parcel level crop data for service/ scheme delivery to farmers.
c. Anonymized parcel level crop data for Geo-spatial use.

(h) States using their own or customized applications must ensure these meet Central Government-prescribed features to qualify for funding.

9.2.4. In case of DCS, State-wise fund allocation would be made in proportion to the Number of Parcels & Cropping Intensity as per the Agriculture Census 2015-16. However, this may be revised as per the new Agriculture Census.

9.2.5. As per the existing guidelines for Centrally Sponsored Schemes, States other than NE and Hilly States will share 40% of the cost, and NE and Hilly States will share 10% of the cost. For UTs, the Central Government will bear 100% of the cost.

9.2.6. For the release of funds, the extant guidelines issued from time to time by the Ministry of Finance, Department of Expenditure shall be followed.

9.2.7. The State may utilize the fund for activities relating to Digital Crop Surveys, such as Remuneration/ Honorarium, Training, IT infrastructure, etc. In no case will the

funds received from the Government of India be used to pay the salary of regular employees.

9.2.8. Funding for the States using their own application or customized reference application would be subject to the Crop Survey Application being used by the state and having all the essential features prescribed by the central government.

9.3. Funding for Geo-Referenced Village Maps(GRVM)

The Digital India Land Records Modernization Programme (DILRMP) scheme of the Department of Land Resources (DoLR) provides funds for digitizing land records, including GRVM. Funds shall also be provided to States through the Mission for establishing Geo-referenced village maps for conducting Digital Crop Surveys. To get financial assistance for GRVM under the Mission States may send the detailed proposal under IT initiatives (earstwhile NeGPA) through Annual Action Plan of **Krishonnati Yojana.**

9.4. Funding for Krishi- DSS project

9.4.1. Funds for implementing Krishi-DSS shall be provisioned under the Digital Agriculture Mission.

9.4.2. Selection and payments to the project vendors would require internal assessment by the Digital Agriculture Division and approval of IFD before funds are released.

9.4.3. Funds for setting up a PMU for the Krishi DSS project will also be provided under the Digital Agriculture Mission.

9.4.4. Any project to further enhance the Krishi DSS project will be provided under this Mission after internal assessment by the Digital Agriculture Division and with the concurrence of the IFD of DA&FW.

9.5. Funding for Soil Fertility and Profile Mapping

9.5.1. The total funds required for the National Soil Mapping programme will be Rs 200 crore over a five-year period, which will be provided to SLUSI under the Digital Agriculture Mission. The funds will be released to SLUSI after the recommendation of PIC, assessment by the Digital Agriculture Division, and concurrence of IFD.

9.5.2. A report on the progress of Soil Fertility and Profile Mapping, both financial and physical, would be furnished by SLUSI to the Digital Agriculture Division, Department of Agriculture and Farmers Welfare, New Delhi, regularly after due certification by INM Division of DA&FW.

9.5.3. A consolidated Utilization Certificate may be furnished at the end of the financial year.

9.6. Funding for DGCES

9.6.1. Funding for DGCES component

(a) The DGCEC is a Central Sector component under the Digital Agriculture Mission through which Funds will be provided to SASAs for conducting CCEs on the field under DGCES.

(b) SASAs will receive Rs. 1000 per CCE for all completed and approved CCEs after each season's conclusion within an agricultural year. The number of completed and approved CCEs will be verified from the DGCES portal/ Data shared through API by the states using own app.

(c) The fund provided to SASA is intended for providing incentives to primary workers, covering labour charges, compensating farmers, and addressing any other miscellaneous expenses incurred during CCEs by primary workers in the field, as well as any additional incentives provided for a CCE. States are free to determine the amount allocated to each category as per their rules and should inform the Center of their decision in writing. This is a prerequisite for claiming the funds under the DGCES.

(d) States that are already offering incentives to primary workers, farmers, or other officials for conducting CCEs may continue with their current practices or opt to provide incentives under DGCES. However, incentives can only be provided under

a single program. States have to provide an undertaking in this regard while claiming the fund after each season.

(e) Funds will be provided to SASAs solely based on the number of completed and duly approved CCEs by both the State and the Center. No funds to be provided against the CCEs rejected by either State/ Centre. SASAs will be responsible for disbursing incentives to primary workers, farmers, and any other officials involved in conducting CCEs.

(f) 2.5% of the total amount allocated to SASAs for each season may be utilized for administrative expenses, such as organizing training sessions or workshops, purchasing equipment for CCEs, and other administrative costs.

(g) Funds will be provided only for the CCEs conducted under DGCES not for CCEs conducted under any insurance scheme.

9.6.2. For States using their own application: States that use their own applications will receive funding if:

(a) SASA prepares the separate CCE plan under GCES exclusively according to GCES methodology and shares it with the Ministry well in advance of starting crop harvesting for each season of an agriculture year.

(b) Their CCE applications include the features prescribed by the central government.

(c) The State agrees to share Plot-level CCE data with the Ministry.

(d) The State's own system includes a separate data approval and supervision module or the State uses the modules developed under DGCES application.

(e) The fund release pattern will remain the same as that of other states implementing DGCES. Payment shall be made against the approved number of CCEs for which data is shared with the Ministry. However, SASA must certify the accuracy of the CCEs they conduct. Funds will only be released after these conditions are met.

(f) Funds will be provided only for the CCEs conducted under DGCES not for CCEs conducted under any insurance scheme.

9.6.3. Funding for increased supervision of CCEs to NSSO (FOD) under DGCES

(a) Presently, NSSO (FOD), MoSPI supervises approximately 15000 CCEs for which DA&FW provides no funds. Funding Support to NSSO (FOD) would be provided under the Digital Agriculture Mission (DAM) to supervise additional CCEs (over & above 15000).

(b) MoSPI need to submit proposal indicating fund requirement for supervising additional CCEs alongwith deliverable & timelines.

(c) Support to SASAs for supervising DGCES is already being provided under the Improvement of Agriculture Statistics (IAS)

9.6.4. Release of Funds

(a) Funds will be released as per the extant guidelines of DoE, MoF, GoI and the directives issued by the O/o PAO, M/o Agriculture & Farmers Welfare issued at time to time.

(b) A report on DGCES's financial and physical progress may be furnished to the Agriculture Statistics Division, Department of Agriculture and Farmers Welfare, New Delhi, regularly at the end of the season.

(c) A consolidated Utilization Certificate may be furnished at the end of the financial year.

(d) The amount to Primary Workers covering labor charges and any other miscellaneous expenses incurred during CCEs by primary workers in the field will be released preferably through Direct Benefit Transfer (DBT) by the SASAs.

(e) However, the state/UT is free to formulate the mechanism to release the amount payable, if any, to the farmers. The tentative format for claiming the fund after each season is given at Annexure V.

9.7. Funding to Academic / Research Institutions, DA&FW for IT initiative support – Conditions:

9.7.1. The DPR may be submitted preferably in the beginning of the year for consideration of the project.

9.7.2. No funds can be utilized under KY by the State/ eligible organizations unless the Assessment Committee of DA&FW has approved the project and the concurrence of the IFD has been obtained.

9.7.3. 100% Funds may be released to academic and research institutes for scalable digital solutions aligned with DPI requirements.

9.7.4. 100% of funds will be released to develop a reference application by the state or through their agency specifically for the central government.

9.7.5. A report on the project's progress, both financial and physical, may be furnished to the Digital Agriculture Division, Department of Agriculture and Farmers Welfare, New Delhi, for consideration for the next release.

9.8. Funding for MNCFC

9.8.1. Funds will be provided to 'Mahalanobis National Crop Forecast Centre (MNCFC)' for the Major Activities of MNCFC, as follows:

(a) Crop acreage and production estimation of major crops under the scheme "Forecasting Agricultural output using Space, Agro-meteorology and Land based observations" (FASAL),

(b) Support to Crop Weather Watch Group and drought monitoring by the States.

(c) Effective implementation of PMFBY, such as area discrepancy analysis, smart sampling, and yield dispute resolution, etc.

(d) Horticulture Crop assessments

(e) Training and capacity building for states and interfacing with Science and Technology institutions.

(f) Geospatial information products and services.

(g) **Support for Global initiatives:** Support to the existing Global programs (a) UNESCAP – Regional Cooperation, (b) Sentinel Asia – Disaster management programme, (c) Geo-Glam – sharing information products.

9.8.2. Funds under Digital Agriculture Mission shall be used to undertake these activities and to scale its operations and leverage the increasing availability of high-resolution satellite datasets and emerging analytical tools.

9.8.3. Project will be sent with the approval of Director, MNCFC which will be examined by Digital Agriculture Division and fund will be released with the concurrence of IFD, DA&FW.

9.8.4. Funds will be released as per the extant guidelines of DoE, MoF, GoI issued at time to time.

9.8.5. A report on the progress of the project, both financial and physical, may be furnished to the Digital Agriculture Division, Department of Agriculture and Farmers Welfare, New Delhi for considering the next release.

10. Monitoring and Evaluation

10.1. AgriStack

10.1.1. National level Agri Stack Steering Committee: A Steering Committee has been constituted under the chairpersonship of the Secretary of the Department of Agriculture & Farmers' Welfare, Government of India, to take decisions on architecture and technologies for the Agri Stack, decisions on policy, rules, regulations, administration and requirement of manpower & infrastructure to support the States in implementation of various components of AgriStack.

10.1.2. State-level Agri stack Steering Committee: Chaired by the Chief Secretary, the committee members include the Secretary of Revenue, Secretary of Agriculture, Secretary IT, Secretaries of other departments, and other members related to Agri stack activities, along with representation from the Government of India. The steering committee may meet once every two months to review the progress of the work done in the State.

10.1.3. State level Agri Stack Implementation Committee: This committee will have the Secretary of Revenue, Secretary of Agriculture, Director (IT)/ Director/Commissioner (Land Records), Director/Commissioner (Agriculture) and other officers, as per the requirements of the State, as members and could be co-chaired by the Secretary Agriculture & Secretary Revenue. States may finalise the Committees as per their requirements and needs. This committee is responsible for the day-to-day implementation of these three tasks and would meet at least once every month.

10.2. Digital Crop Survey

10.2.1. States will verify and send the details of the villages in which they have conducted DCS each season, and the Central Project Monitoring Unit will confirm the same.

10.2.2. The release of funds to the States will be linked to sharing of DCS data via API to the Ministry.

10.2.3. States shall devise a mechanism for verification to ensure the authenticity of data by conducting a minimum of 2 per cent sample check through State Agricultural Statistics Authority (SASA) and/ or NSSO.

10.3. Krishi Decision Support System (Krishi – DSS)

10.3.1. A Project Steering Committee (PSC) under the chairpersonship of the Additional Secretary (Digital Agriculture), DA&FW, shall review and finalize the technical documents for developing the Krishi-DSS platform/modules.

10.3.2. A Project Implementation Committee (PIC) constituted under the chairmanship of Director, MNCFC shall monitor implementation of the project viz. module development status, testing result, IT infrastructure deployment status, Manpower deployment status, Monitoring of Feedback system, etc.

10.3.3. A Strategic Program Management Unit for Strategizing, Monitoring and Improvement of Krishi Decision Support System (K-DSS) shall be onboarded by the Centre.

10.4. Soil Fertility and Profile Mapping

10.4.1. The progress of the project will be monitored regularly. Committees will be constituted under the chairmanship of the Secretary, DA&FW and the Joint Secretary INM, DAFW, with distinguished Soil Scientists / Officers as members to guide, plan and monitor the overall activities of the National Soil Mapping programme.

10.4.2. SLUSI will be the Nodal Agency for the execution of the NSMP-10K Project. A Project Implementation Committee will be constituted under the chairmanship of the Chief Soil Survey Officer, SLUSI, and other Soil Scientists / Officers as members to plan, execute, fund management and monitor the activities of the National Soil Mapping Programme.

10.5. Digital General Crop Estimation Survey (DGCES)

10.5.1. Supervision of CCEs by NSSO (FOD) and SASAs

(a) SASAs and FOD, NSSO shall jointly supervise the CCEs conducted under DGCES for all seasons of every agricultural year across all implementing States/ UTs.

(b) To ensure proper supervision of crop-cutting experiments, a sample of approximately 55,000 experiments shall be selected annually. Out of these, NSSO will supervise 40,000 experiments, while SASAs will supervise 15,000. These two sets of samples must be non-overlapping. To improve the accuracy of the estimates, the number of supervised samples may be increased by joint agreement between the State, NSSO, and DA&FW.

(c) All CCE supervision must be conducted using the supervision module developed by the Ministry within the DGCES mobile application and web portal.

(d) States using their own applications may also utilize the Ministry's supervision module for monitoring CCEs in their respective States or develop a supervision module according to the existing methodology in their own applications.

10.5.2. Monitoring Mechanism of CCEs conducted under DGCES

i. SASAs shall establish a State-Level Implementation Committee for DGCES, chaired by the SASA Director, with the nodal officer, representatives from departments involved in conducting CCEs and Regional Head of the concerned regional office of NSSO (FOD) as members. This committee will review the implementation of DGCES every fortnight, starting from each season in the agricultural year. The proceedings of the review meetings and progress updates shall be shared with the Ministry.

ii. The Ministry will conduct periodic meeting of DGCES implementation under the Chairmanship of the Adviser (AS).

iii. Ministry officials will inspect the CCEs conducted under DGCES in all implementing States/ UTs for each season in the agricultural year.

10.6. IT Initiative Support to States, Academic / Research Institutions

10.6.1. The Joint Secretary (Digital), Digital Agriculture division will periodically monitor the sanctioned projects.

10.6.2. The States shall submit a project kick-off report and periodic reports to the Ministry on the project's progress including both financial and physical.

10.6.3. A consolidated Utilization Certificate may be furnished at the end of the financial year along with physical progress report.

10.7. Activities of MNCFC

10.7.1. All activities of MNCFC shall be monitored by the Director, MNCFC, who shall undertake regular review meetings with the MNCFC and send progress of the project, both financial and physical, to the Digital Agriculture Division, Department of Agriculture and Farmers Welfare, New Delhi.

10.7.2. The Joint Secretary (Digital), Digital Agriculture division, will also periodically monitor projects.

11. Training and Capacity Building

11.1. Training for Field Activity Planning for Farmer Registry

Building local capacity for field verification by creating Master Trainers on Farmer Registry Software and Farmer Registry Mobile Application.

States have to facilitate training of the State Master Trainers. This training will be conducted by the Central and SPMU team in presence of Secretaries of Revenue and Agriculture Department. Central teams may provide the required documents in English language to the state, which may be customised for local use.

11.2. Roles and Responsibilities of State Master Trainers

(a) Train District Training: Conduct comprehensive training sessions for district-level trainers.

(b) Development of Training Materials: Assist in the creation and refinement of available training modules and materials in case it needs to be contextualised as per regional needs.

(c) Monitoring and Evaluation: Oversee the training process at the district and Taluka to ensure quality and consistency.

(d) Reporting: Send Training reports, attendance, and feedback forms with SPMU after completion of each training through the Agriculture Directorate Office.

(e) Becoming the Primary Points of Contact (PPOCs): Be the point of contact for the District Trainers and all communication and share updates on progress and issues to be addressed to ensure smooth operationalization of the system.

11.3. Training of District, Taluka and Village Teams for creation of AgriStack

The experience gained during learning of State Master Training and the PoC, would play a crucial role in expediting a cascading level of learning for District, Taluka and Village Teams. The State Master Trainers should be split across the 5 districts that they are assigned to and should be sent to the districts for the desired 3 days and conduct training across the districts over the course of the next 3 days, to ensure that the District, Taluka and Village Teams are well equipped to take the training to the next level.

Note- It is recommended to conduct the required training in a **Classroom manner**, and **NOT via Video Conferencing**.

The training material that was shared during State Master Training can be used, or the State Master Trainer can create their own training materials and use it for knowledge sharing with their Districts.

Handbook on creation of Farmer Registry issued by DA&FW is to be referred for detailed process of creating Farmer Registry including Training component.

11.4. Training for Conduct of Digital Crop Survey

11.4.1. **Master Trainers:** Master trainers are crucial for training district-level trainers, crop surveyors, and supervisors. The Central Government will guide the number and roles of master trainers, and representatives will visit States to assist with their training.

11.4.2. **District Trainers:** District trainers are responsible for supporting crop surveyors and supervisors and helping resolve issues during the 45-day survey period. Each district trainer should oversee no more than 20 surveyors to ensure effective management.

11.4.3. The Central Government will provide a mobile training app that mirrors the actual Crop Survey App. This app will help users familiarize themselves with the application.

11.4.4. The Central Government will prepare training materials (videos, PPTs, manuals) in English. States shall translate these materials in local/official language and distribute them to all concerned parties.

11.4.5. The Central Government will create instructional videos covering different aspects of the crop survey process. These videos will explain the philosophy, importance, and implementation of crop surveys and land records.

11.5. Training of users of Krishi-DSS

For effective utilization of the Krishi-DSS, it is of utmost importance to develop an ecosystem for training and capacity building of all stakeholders involved. Such training of shall be conducted by the strategic PMU team of the Centre. This includes hands-on training on the software's functionality and processes. The key initiatives required in this direction are:

(a) Development of master training content and user manuals
(b) Development of online training content and video tutorials
(c) Preparation of training calendar and conducting training workshops

11.6. Training of Field Staff for conducting DGCES

(a) The Ministry will provide training to the master trainers of the States/UTs envisioning drill down approach of knowledge transfer till village level primary workers. The SASAs may notify the Ministry if any further technical assistance is required for the primary workers' training purpose.
(b) The SASAs shall arrange training workshops for the primary workers as well as district/block level officers.
(c) SASAs shall organise state-level training programs on the use of the DGCES web portal and mobile application for state officials at least once per agricultural year. However, it is recommended to provide training for each season within the agricultural year.
(d) Primary workers training module will include the CCE data collection process using DGCES mobile application with an emphasize on how to capture image data, drawing polygon, green weight measurement and how to operate the mobile application in offline mode.
(e) SASA to arrange training workshop for primary workers for each agricultural year.

12.Information Education and Communication (IEC)

The Digital Agriculture Mission is a collaborative endeavour between the State and Central Governments that aims to revolutionize agriculture through digital infrastructure. To ensure the successful adoption of Agri Stack, DGCES, Krishi-DSS, etc., among farmers, primary workers, citizens, local bodies, research organisations, etc., effective Information, Education, and Communication (IEC) activities are essential. This includes the identification and mobilisation of ground-level functionaries for sensitization and creating awareness, the development of an IEC plan and adoption of appropriate communication channels.

Key Points for conducting IEC activities:

(a) **SMS Campaigns:** Launch targeted SMS campaigns to reach concerned stakeholders directly, providing them with concise information about the benefits and functionalities of Mission Components, viz. Agri Stack, DGCES, Krishi-DSS, etc.

(b) **Door-to-Door Campaigns:** Mobilize village Pradhans and local volunteers to conduct door-to-door campaigns, engaging farmers in one-on-one discussions and demonstrations.

(c) **Government School Awareness Programs:** Collaborate with government schools to organize awareness programs, educating students and their families about Digital Agriculture Mission during parent-teacher meetings or special assemblies.

(d) **Farmer Cooperatives Engagement:** Partner with farmer cooperatives to organize workshops and training sessions on Digital Agriculture Mission, leveraging their networks to disseminate information among a wider farming community.

(e) **Newspaper Articles and Advertisements:** Publish articles and advertisements in local newspapers, highlighting success stories, case studies, and testimonials of farmers who have benefitted from the components of the Mission.

(f) **Radio Broadcasts:** Air informative radio broadcasts and interviews featuring agricultural experts and government officials discussing the importance and advantages of Digital Agriculture Mission for farmers.

(g) **Above the line "ATL" Campaigns:** Design and distribute posters, pamphlets, and flyers showcasing the features and usage of Mission components, strategically placing them in prominent locations such as agricultural markets, government offices, and community centres.

(h) **Digital Platforms:** Leverage digital platforms such as social media, websites, and mobile applications to engage with farmers, providing them with access to informative videos, tutorials, and interactive content related to the Mission.

A tentative IEC plan for Digital Agriculture Mission is provided in Annexure VI.

Annexure I: State-wise area covered under Detailed Soil Survey and Mapping by SLUSI

S. No	State	Total Area (ha)
1	Andaman & Nicobar Islands	76696
2	Andhra Pradesh	1131058.8
3	Arunachal Pradesh	35581
4	Assam	142892
5	Bihar	153689
6	Chandigarh	318
7	Chhattisgarh	1157021
8	Dadra & Nagar Haveli	20404
9	Delhi	21613
10	Goa	164307
11	Gujarat	2291536
12	Haryana	22352
13	Himachal Pradesh	485520
14	Jammu & Kashmir	16463
15	Jharkhand	1954721.26
16	Karnataka	3040881
17	Kerala	376781
18	Madhya Pradesh	4067383.02
19	Maharashtra	3020489
20	Mizoram	141288
21	Odisha	2268632.88
22	Punjab	517915
23	Rajasthan	1112598
24	Sikkim	110046
25	Tamil Nadu	1134893
26	Telangana	2044075
27	Tripura	51164
28	Uttar Pradesh	2619234.96
29	Uttarakhand	157763
30	West Bengal	1425285.5
Grand Total		29762601.42 29.76 M ha

Annexure II: Essential features for States/UTs having own mobile application and web-portal for conducting CCEs

(Applicable for State/UTs having own application only)

States /UTs must ensure compatibility of their own applications with the Ministry developed DGCES application with the following features:

(c) The mobile application must be GPS enabled. Geo-tagging of the experimental plot is mandatory.

(d) Image of the plot, crop harvesting, and weighment must be captured in the application while conducting CCEs.

(e) Crop weighment photo capture is mandatory. Irrigation status of the plot must be captured. Plot area must be captured in Ha.

(f) States/UTs to give a demonstration of their own application to the Ministry. The central technical team will check the compatibility of the State own application before onboarding. Fund will be released if all the above- mentioned specifications are being satisfied.

Annexure III: Parameters for data sharing through API

(Applicable for State/UTs having own application only)

1. Year
2. Season
3. State Name
4. State LGD Code
5. District Name
6. District LGD Code
7. Tehsil Name
8. Tehsil LGD Code
9. Village Name
10. Village LGD Code
11. Primary Worker Name
12. Primary Worker Mobile No.
13. Experiment No.
14. Finally Selected Survey No.
15. Crop Name
16. Crop Type
17. Crop Variety
18. Is Picking Crop (Yes/No)
19. Farmer Name
20. Farmer Mobile No.
21. Crop Area (in Ha)
22. Date of Sowing
23. Date of Harvesting
24. Plot Size
25. Plot Shape
26. Latitude
27. Longitude
28. Polygon Created Date/Time Stamp
29. Irrigated/Rainfed
30. Overall Field Photo
31. Crop Harvesting Photo
32. Crop Weighment Photo
33. Green Weight with fodder/cob (in Kgs)
34. Green Weight without fodder/cob (in Kgs)
35. Green Weight taken for driage (in Kgs)
36. Dried Weight (in Kgs)
37. CCE Status (Completed/Experiment Loss)
38. Approval Status (Approved/Rejected)

Annexure IV: Format for data sharing for edited experiments

(Applicable forState/UTs having own application only).

	State		
	District		
	Tehsil		
	Village		
	Crop Name		
	Experiment No.		
	Data Edited By	Primary Worker	State
Form 1	Irrigation Status		
	Sowing Date		
	Harvesting Date		
Form 2	Total Green Weight / Green Weight (KGs)		
	Crop Condition		
	Crop Variety		
Form 3	Actual Green Weight Taken for Driage(KGs)		
	Dried Weight (KGs)		
	Final Yield (Kg/Ha)		
	State Status		
	Central Status		
	Remarks		

Annexure V: Fund Requisition Form under DGCES

Details of the SASA	
State:	Date:
Name of the Department:	
Office Address:	
Contact:	Email:
Name of the Applicant:	
Designation:	
Contact:	Email:

Account Details	
Name of the Bank:	
Branch Address:	
Account Number:	
IFSC Number	

Fund Utilization Details	
Agriculture Year	
Season	
Number of Primary workers involved	
Number of CCEs planned for the season	
Number of CCEs conducted in the season	
Number of CCEs approved by states	
Number of CCEs approved by the Ministry	
Number of CCEs approved by both State & the Ministry **(a)**	
Total amount claimed	**1000*a**

Unspent Fund Details (If Any)	
Fund received for previous season	
Fund utilized	
Unspent fund	
Remarks	

I,_____, <Designation> being the nodal for implementing DGCES in <State Name>, understand my roles and responsibility as

mentioned in the implementation guideline and ensure the data quality and accuracy as approved by the State.

I hereby declare that the amount claimed in this form, is the only source of incentives to the primary workers for conducting CCEs. No other funds are being claimed under any other program.

I hereby assure, information furnished above are true to my knowledge.

Annexure VI: IEC Plan for Digital Agriculture Mission

S. No.	Communication Mode	Activity	Communication Medium	Timeline
Mass Media Campaign				
1	Print media advertisement	4 press releases on key highlights of Digital Agriculture Mission	Press Release	Atleast one (1) press release in every quarter
2	Tele-communication	SMS / whatsapp to farmers / beneficiaries regarding DAM initiatives and its benefits to Agriculture sector	SMS / Whatsapp	Once in every month
3	Video on Digital Agriculture Mission	Playing of Digital Agriculture video in Krishi channels like DD kisan, youtube channels	Through DD, youtube etc.	As per channel's schedule
Social Media Campaign				
3	Regular updates on social media	Posting of tweets, insta-posts / story etc. to promote awareness	Social media platforms i.e. X, Instagram, Facebook etc.	Every week
4	Social media Campaign	• Promotion and showcasing of achievements of Digital Agriculture Mission on social media platforms through a campaign of 7 days • Posting of photographs from ground using mobile / web applications developed under Digital Agriculture Mission • Posting of videos / stakeholder interviews highlighting ease of doing farming and agriculture decision making through use of DAM initiatives	Social media platforms i.e. X, Instagram, Facebook etc.	A campaign of 7 days to be rolled out every quarter
Personal Social Media Handles of Officers				
5	Personal social media handles	• Posting, retweeting, resharing of social media posts	Social media platforms i.e. X, Instagram, Facebook etc.	Throughout the year
Creatives for Circulation				
6	Hoardings in public places	Hoardings on key DAM initiatives in public places such as bus stop, railway station, market area etc.	Hoarding	Twice in a year
7	Booklet on Success Stories	A compendium with infographics and storylines on achievements	Print	January

S. No.	Communication Mode	Activity	Communication Medium	Timeline
		and success stories to showcase success stories of DAM initiatives		
8	Video Creative	Circulation of video byte on Digital Agriculture Mission among States, KVKs, industry bodies with a request to play the same in office premises, events, movie halls etc.	Video bytes in office premises, events, movie halls etc.	A new byte every quarter
Events, Exhibitions, Melas and Conferences				
9	Workshops and Media conclave	Regional workshops and media conclaves organised by the Ministry to spread awareness about the mission. The regional workshops would require participation from State Govts, Agri business startups, Digital Agriculture experts, etc.	Regional Workshops and Media conclave by Hon'ble Minister of Agriculture	October - November
10	Celebration of 'Digital Krishi Diwas' pan-India with the support of State Governments	• Showcasing benefits and success stories of Digital Agriculture Mission through events, melas, exhibitions and conferences organised by State Govts. in their States on the occasion of "Digital Krishi Diwas"	• Showcasing of creatives, banners, hoardings on digital agriculture mission of the Govt. of India in such events • Uploading of photographs of celebration of Digital Krishi Diwas on social media	December
11	Online Quiz and Krishi competitions	Playing of online quiz at event sites and distribution of prizes	Mobile application	December
12	Awareness generation through schools	Collaborate with government schools to organize awareness programs, educating students and their families about Digital Agriculture Mission during parent-teacher meetings or special assemblies.	Awareness programmes during parent-teacher meetings or special assemblies	Regularly
13	Farmer Cooperatives Engagement	Partner with farmer cooperatives to organize workshops and training sessions on Digital Agriculture Mission, leveraging their networks to disseminate information among a wider farming community.	Workshops and training sessions	Regularly

Department of Agriculture and Farmers Welfare
Ministry of Agriculture and Farmers Welfare
Government of India